

Topic Hotlist: Forces of Flight

Introduction

This is a collection of Internet sites about the forces of flight, with a special emphasis on Bernoulli's Principle

Internet Resources

Forces of Flight

<http://www.fi.edu/flights/own2/forces.html> is the site provided by the Franklin Institute in Philadelphia. This site provides colorful, well-designed graphics and easy-to-read explanations. Appropriate for grades 4 – 8.

<http://www.planemath.com/activities/pmenterprises/forces/forces1.html> is a tutorial written by a former elementary school teacher for beginner pilots. This site has some nice graphs that engage students in thinking about how pressure and forces change with changes in velocity. Appropriate for grades 6-9.

<http://www.allstar.fiu.edu/aero/fltmidfly.htm> is a site partially funded by NASA that provides some of the mathematical details about how to calculate forces of flight. This site also has some great video animations about the flight control surfaces and definitions of pitch, roll, and yaw. Appropriate for grades 9 – 12.

<http://www.wpafb.af.mil/museum/zone/ff1.htm> is a site from the US Air Force Museum that has some basic explanations of the forces of flight with simple pictures and arrows. Appropriate for grades 4 – 8.

<http://wings.avkids.com/Book/Flight/advanced/index.html> is a site with mostly text that is written for kids to understand basic aerodynamics and aerodynamic forces. Appropriate for grades 6 – 9.

<http://www.nasm.edu/galleries/gal109/NEWHTF/HTF030.HTM> is a site from the Smithsonian's National Air and Space museum that discusses how things fly and the forces of flight. Appropriate for grades 6 – 9.

<http://home.earthlink.net/~voraze/rocketry/lp.html> is a site with lessons plans related to flight forces and using model rockets to help students become interested in why things fly and basic aerodynamics. Appropriate for grades 6 – 9.

<http://www.howstuffworks.com/airplane.htm> is the "How Stuff Works" site explanation of how things fly. Appropriate for grades 6 – 9.

Internet Resources (continued)

Bernoulli's Principle

<http://www.sasked.gov.sk.ca/docs/physics/u6e3phy.html> is a site with the mathematical formulas that describe Bernoulli's Principle and some sample lesson plans. Appropriate for grades 9 – 12.

<http://www.aa.washington.edu/faculty/eberhardt/lift.htm> is a site that explains why the “popular” definition of why airplanes fly is not complete. Appropriate for grades 9 – 12.

<http://www.mste.uiuc.edu/davea/aviation/bernoulliPrinciple.html> is a site that explores Bernoulli's Principle as inquiry. Appropriate for grades 9 – 12.

http://theory.uwinnipeg.ca/mod_tech/node68.html

<http://www.sciencejoywagon.com/physicszone/lesson/02forces/bernoulli/bernoulli.htm> is a site that includes demonstrations and examples of Bernoulli's Principle.

<http://pilotsweb.com/principle/bernoulli.htm> is a site with a simple picture and explanation of Bernoulli's Principle.

<http://nasaii.ited.uidaho.edu/curriculum/velocity.htm> is a site with teacher demos of Bernoulli's Principle.

http://www.carolina.com/calendar_activities/2001/0109.asp is the Carolina Science Supply company's list of B. Principle demos.

<http://www.spartechsoftware.com/reeko/Experiments/AttractingCups.htm> is a neat demo of Bernoulli's Principle.

<http://www.wpafb.af.mil/museum/edu/soar2d.htm> has more demos of Bernoulli's Principle.

<http://www.dfrc.nasa.gov/trc/k4guide/06PaperBag.pdf> has an easy demo for elementary school kids learning about Bernoulli's Principle.

Notes to the Educator/Parent

This collection of Internet sites has information regarding the forces of flight and Bernoulli's principle. It is designed for use by teachers and students who want to learn about how things fly and for use by students with the Forces of Flight Webquest.

Standards

This Topic Hotlist partially fulfills the following national standards from the AAAS Benchmarks for Science Literacy:

Habits of Mind: Critical Response Skills: By the end of the 12th grade, students should:

- Be aware, when considering claims, that when people try to prove a point, they may select only the data that support it and ignore any that would contradict it.
- Suggest alternative ways of explaining data and criticize arguments in which data, explanations, or conclusions are represented as the only ones worth consideration, with no mention of other possibilities. Similarly, suggest alternative trade-offs in decisions and designs and criticize those in which major trade-offs are not acknowledged.

Habits of Mind: Values and Attitudes: By the end of the 12th grade, students should:

- Know why curiosity, honesty, openness, and skepticism are so highly regarded in science and how they are incorporated into the way science is carried out; exhibit those traits in their own lives and value them in others.

Historical Perspectives: Uniting the Heavens and Earth: By the end of the 12th grade, students should know that:

- Newton's system was based on the concepts of mass, force, and acceleration, his three laws of motion relating them, and a physical law stating that the force of gravity between any two objects in the universe depends only upon their masses and the distance between them.